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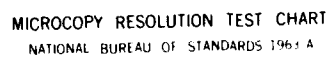UNCLASSIFIED   AFIT/CI/NR-85-14T   F/G 5/1   NL

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFIT/CI/NR 85-14T	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) An Application of an Information Center Concept to United States Air Force Base Level Organizations		5. TYPE OF REPORT & PERIOD COVERED THESIS/DISSERTATION
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Michael D. Acres		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS AFIT STUDENT AT: Colorado State Univ		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS AFIT/NR WPAFB OH 45433		12. REPORT DATE 1984
		13. NUMBER OF PAGES 72
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASS
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

APPROVED FOR PUBLIC RELEASE: IAW AFR 190-1

LYNN E. WOLAVER   28 Feb 85
Dean for Research and
    Professional Development
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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ABSTRACT OF PROFESSIONAL PAPER

AN APPLICATION OF AN INFORMATION CENTER CONCEPT TO UNITED STATES AIR FORCE BASE LEVEL ORGANIZATIONS

Since the 1970s, the Information Center (IC) concept has received acclaim as a solution for increasing End User productivity. Basically the Information Center, as defined by IBM, is a Department catering to End User data automation needs at their level. In other words, the Users are doing their own computer processing with the help of the IC.

Presently, the Information Center concept is being implemented in both the business community and in the U.S. Government. However, the Department of the Air Force is missing from this list. Air Force Base Level Organizations should have capabilities similar to those being used in civilian Information Centers to access information.

This study examined the informational needs of Base Level Organizations and developed an Information Center concept suitable to meet those needs. The concept was then applied to show how these needs might be resolved. The concept addresses four areas: a mission statement, Information Center functions, staff, and evaluation.

Michael D. Acres
Captain, USAF
Master of Science
Colorado State University
Fort Collins, Colorado 80523
Fall 1984, 72 Pages

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Air Force Base Level Organizations

AUTHOR: ACRES, MICHAEL D.

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STATEMENT(s):

PROFESSIONAL PAPER

AN APPLICATION OF AN INFORMATION CENTER CONCEPT

TO UNITED STATES AIR FORCE BASE LEVEL ORGANIZATIONS

Submitted by

Michael D. Acres

Computer Information Systems

In partial fulfillment of the requirements

for the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Fall 1984
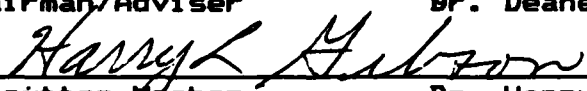
COLORADO STATE UNIVERSITY

FALL 1984

WE HEREBY RECOMMEND THAT THE PROFESSIONAL PAPER PREPARED

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APPLICATION OF AN INFORMATION CENTER CONCEPT TO UNITED

STATES AIR FORCE BASE LEVEL ORGANIZATIONS" BE ACCEPTED AS

FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF MASTER OF

SCIENCE IN COMPUTER INFORMATION SYSTEMS.

<u>Committee on Graduate Work</u>

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Chairman/Adviser   Dr. Deane M. Carter

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Committee Member   Dr. Harry L. Gibson

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ABSTRACT OF PROFESSIONAL PAPER

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Since the 1970s, the Information Center (IC) concept has
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Michael D. Acres
Computer Information Systems
Colorado State University
Fort Collins, Colorado 80523
Fall 1984

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CHAPTER ONE

INTRODUCTION

F. Richard Lennon from United Technology said it well,
"The Information Center is a giant step forward in a compa-
ny's ability to give its employees a simple, effective way
to meet their own departmental and individual information
processing needs."(1) Information Centers (ICs) in the
"civilian" environment are providing a means for helping
eliminate the applications backlog and giving End Users
access to locked-up data while maximizing their Data Proces-
sing (DP) resources.(2)

The Information Center concept first surfaced in the
1960's. End Users rarely had direct access to computer
terminals that were linked to the company mainframe. In-
stead, the Management Information System (MIS) Departments
controlled all facets of computing from systems development
to report generation. In the 1970's, IBM reintroduced the
concept.(3) Essentially, the "new" concept defined the
Information Center as a Department catering to End User data
automation needs at their level. The Center provides End
Users with hands-on access to the company's mainframe com-
puter or microcomputers. In addition, DP staff members are
available to assist the Users in manipulating the desired
data. An IC concept is illustrated at Figure 1, Page 2.

1

FIGURE 1

AN EXAMPLE OF AN INFORMATION CENTER

END USERS

USER FRIENDLY DIALOG

| AD HOC REQUESTS | DECISION SUPPORT | OFFICE AUTOMATION |

DATA DICTIONARY

DATA BASES
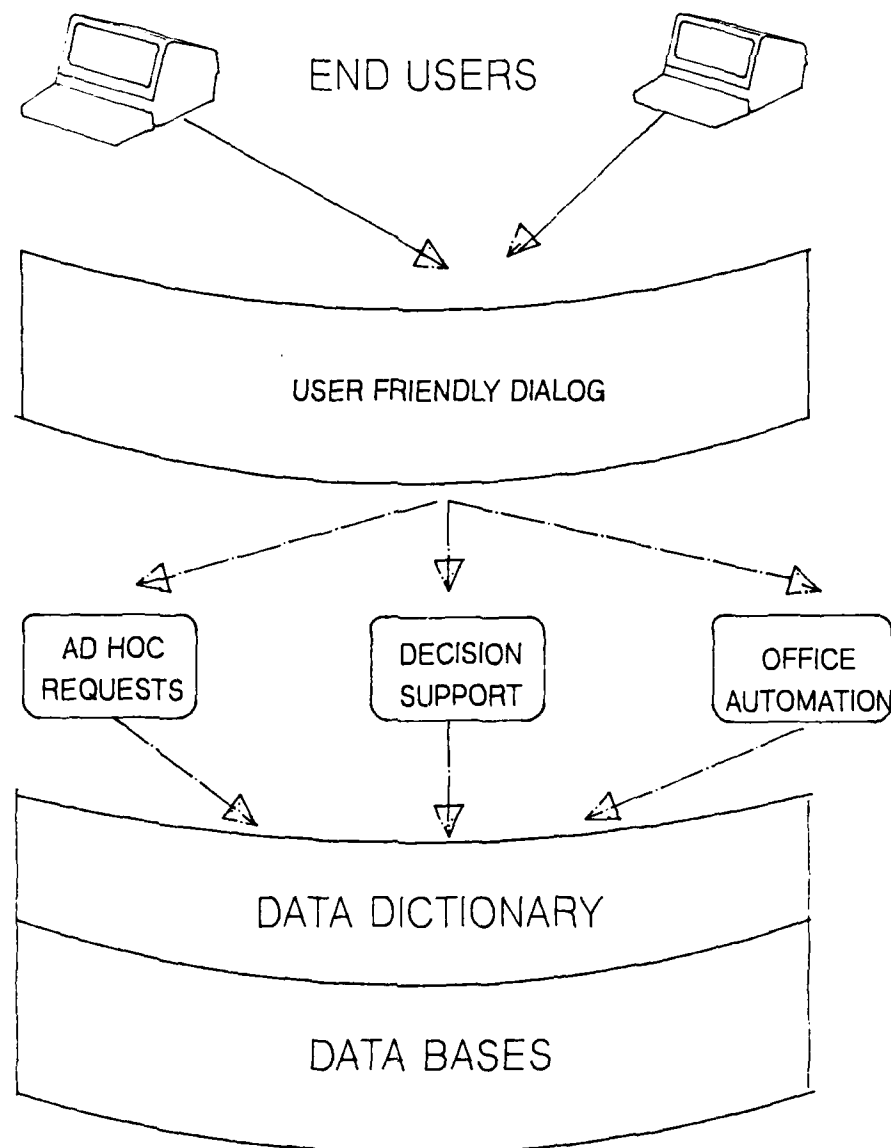
Information Centers are rapidly finding a home in many corporations. The "Crwth Information Center Survey" (4) conducted by Crwth noted that approximately 1,400 Information Centers have been established since 1976. Approximately 2,100 Centers are expected to be in operation by the end of 1984. A Data Processing Management Association (DPMA) Survey, answered by about 200 members, revealed that more than 40% of those answering have an Information Center. An additional 19% will have an IC in place by 1985.(5) As George Harrar, Senior Editor for COMPUTERWORLD, stated, "The premise and promise of the Information Center is simply stated: Users can solve many of their own problems when provided with proper tools and techniques."(6) As seen in the above discussion, ICs are becoming popular in the business world.

Presently, there are 20 federal offices in the Washington, D.C. area that have established Information Centers.(7) This development has occurred over the last two years in such organizations as the Veterans Administration, the Food and Drug Administration, the Department of Agriculture, the Environmental Protection Agency, the Securities and Exchange Commission, the Library of Congress, the Army, the Navy, the U.S. Postal Service, the Labor Department and the House of Representatives. However, the Department of the Air Force is missing from this list.

The Department of the Air Force is essentially a big business. Its managers and employees want to process and

analyze data in a timely manner similar to their "civilian counterparts". Daily Air Force operations revolve around the Air Force Base. As such, there are many organizations located on the Base that must function smoothly. These organizations, referred to as Base Level Organizations, correspond closely to departments within civilian businesses. For example, Base Level Finance handles money matters for the Base, as does a Finance Department in a civilian business manage the company's money. Hence, managers and their employees at Base Level Organizations should have similar capabilities to access information.

OBJECTIVE

Since the Information Center is heralded as a solution for decreasing the applications backlog and increasing the End Users productivity in the "civilian environment", the objective of this study is to evaluate the Information Center concept in terms of its ability in meeting the needs of Air Force Base Level Organizations to solve their daily operating problems.(8) In 1983, the Air Force conducted a study addressing the explosive growth of information technology and concluded that "technological advances had made it more difficult for the Air Force to conduct normal business in the realm of information systems".(9) If the Information Center can assist in meeting this need, a plan will be developed for utilizing the concept. An article by Chester Mills detailed a plan (Figure 2, Page 5) for constructing an IC.(10) During the plan's first phase, End User requirements

4

FIGURE 2
INFORMATION CENTER
STRATEGIC PLANNING PROCESS

POTENTIAL

INFORMATION CENTER

USER REQUIREMENTS

ANALYSIS

UNDER-
STANDING

AND MANAGING

INFORMATION CENTER

OPERATIONS AND

PROLIFERATION

1

4

2

3

POTENTIAL

INFORMATION

CENTER USER

KNOWLEDGE AND

EXPERTISE

PREPARING

FOR

INFORMATION CENTER

IMPLEMENTATION
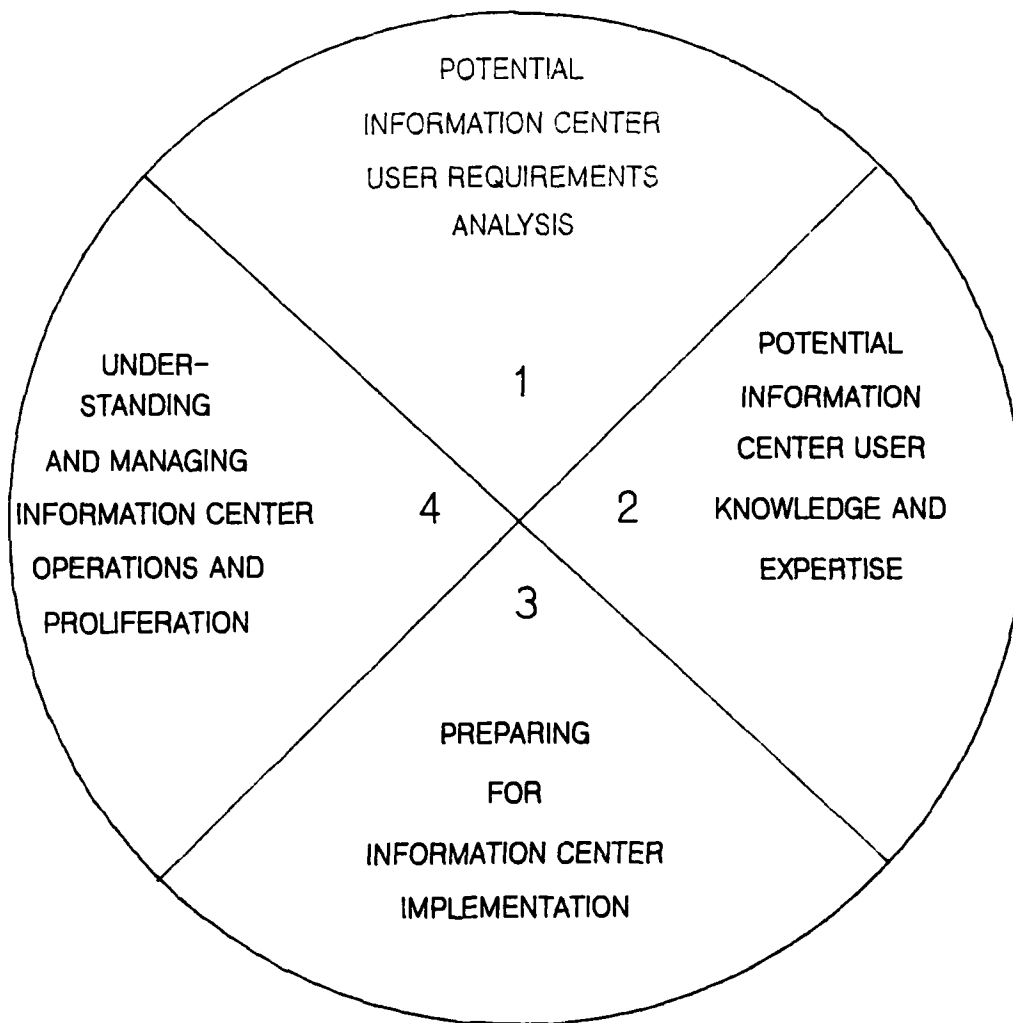
SOURCE: DATA MANAGEMENT
FEBURARY 1984

and functions to be performed within the IC are examined. As Mills' article establishes an Information Center planning process, it will serve as an excellent tool for developing an Air Force Information Center concept. Therefore, for the purpose of this study, the first phase of Mills' pl..n will be used as a guideline.

SCOPE and LIMITATIONS

This study is concentrating on the Information Center concept and its ability to meet present and potential information needs of Base Level Organizations. Therefore, Base Level Organizations common to all Air Force Installations are studied. In order to gain a better understanding of Base Level Organizations, the following Bases were examined:

TABLE 1
Air Force Bases Studied

Function	Base	Location
Training	Lowry AFB	Denver, Colorado
Strategic Missiles	F. E. Warren AFB	Cheyenne, Wyoming
Combat Flying	Dyess AFB	Abilene, Texas.

Lowry and F. E. Warren were studied because of their close proximity to Colorado State University. Dyess was studied because the Base Level Computer Manager is an acquaintance. Also, the physical aspects of the Information Center, general hardware and software requirements, and the Center's location will be discussed for information purposes only.

METHODOLOGY

Primary and secondary research were undertaken for this study. Interviews were undertaken with Air Force personnel to develop a first hand impression of Base Level decision-making problems and information needs. To better understand how Information Centers are currently being used, civilian businesses were interviewed. Secondary sources essentially involved library research. Articles addressing specific Information Center examples and concepts associated with ICs were read. As the IC concept is relatively new, only the most current articles were studied. The articles selected were published after 1981. These articles were mainly extracted from computer-based periodicals and journals such as COMPUTERWORLD, DATAMATION, DATA MANAGEMENT, etc.

Information collected from primary and secondary sources were used in formulating an Information Center concept suitable for an Air Force Base environment. Using secondary sources, a preliminary concept was formulated. Then, using interview results, the preliminary concept was refined. This refined concept was then applied in an effort to facilitate Base Level problems.

PROCEDURES

Initially, Chapter Two provides an insight into how control flows throught the Air Force Command structure. The remainder of the Chapter was devoted to describing organizations generic to Air Force Bases. This Chapter will provide a concise view of how the Air Force Command structure works

7

and how Base Level Organizations function to meet the needs of the Command structure.

In Chapter Three, an Information Center concept, suitable for an Air Force Base, was developed. Initially, an historical look at the IC concept shows how the need for Information Centers, in the business community, evolved. Then, using secondary sources as a basis, an initial concept applicable to the Air Force was developed. Finally, this initial concept was refined with information gathered from primary sources (ie., interview with local businesses).

In Chapter Four, problems associated with decision-making and information needs at Base Level Organizations are identified. Next, the Information Center concept, developed in Chapter Three, was applied in an attempt to facilitate these problems or needs.

Finally, Chapter Five summarizes the proposed Information Center concept and its ability to facilitate daily problem-solving activities on an Air Force Base. As only the first phase of implementing an Information Center was addressed, a starting point for further study is recommended. Endnotes, at the end of each Chapter, will be used in lieu of footnotes. At the end of this report is a Bibliography containing materials referenced in this study.

ENDNOTES

1. Wayne L. Rhodes. "The Information Center Extends a Helping Hand." Infosystems, Jan. 1983, p. 26.

2. Chester R. Mills. "The Construction of an Information Center." COMPUTERWORLD Extra - Micro Mission., Nov. 30, 1983, p. 71-72.

3. Tor Guimaraes. "The Evolution of the Information Center." DATAMATION, Jul. 15,1984, Vol. 30, No. 11, p. 127.

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6. George Harr. "The Users' Report," COMPUTERWORLD, Dec. 26, 1983/Jan. 2, 1984, pg. 71.

7. Betts, Mitch. "Micro info centers seen catching on in Federal offices." COMPUTERWORLD, Jul. 9, 1984, p. 13.

8. Rhodes, p. 31.

9. Lisenby, Bill, Captain, USAF. "INFORMATION SYSTEMS OFFICERS - A NEW BREED." AFRP 36-1, Officers' Career Newsletter, Apr-Jun 1984, p. 2.

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CHAPTER TWO

AIR FORCE BASE LEVEL ORGANIZATIONS

An organization's mission must be understood if organizational problems are to be effectively studied. The Department of the Air Force comprises all elements of the Air Force. It is administered by a civilian Secretary. The principal functions of the Air Force are assigned by the Secretary of Defense. By examining the Air Force's mission, primary functions and subsequently Base Level operations, it will become clear why these low level Base Organizations are important to the Air Force and can benefit from using an Information Center.

MISSION

The Air Force's primary mission, as it is sometimes referred to, is to "fly and fight." In other words, the mission is to provide aerospace forces capable of supporting the Nation's objectives in peace and war. In accomplishing this mission, the Air Force must provide:

1. Strategic aircraft and missile forces necessary to prevent or fight a general war;

2. Land-based tactical air forces needed to establish air superiority over ground battle areas and air support to ground forces in combat;

3. The primary aerospace forces for the
    defense of the United States against air
    and missile attack; and

4. The primary airlift capability for use by
    all the Nation's Military Services.(1)

FUNCTIONS

Functions can be divided into two categories: those the
Air Force is primary responsible for, and those performed in
conjunction with other Services (ie., Army, Navy). Primary
functions include: (2)

1. Conduct prompt and sustained combat oper-
    ations in the air to defeat enemy airpower;

2. Formulate doctrine and procedures for the
    organizing, equipping, training, and em-
    ployment of the Air Force forces;

3. Provide forces for strategic air warfare;

4. Provide air transport for worldwide de-
    ployment;

5. Provide adequate, timely, and reliable
    intelligence;

6. Furnish close combat and logistical air
    support to the Army and Marines; and

7. Provide aerial photography for cartographic
    purposes.

Collateral Functions include: (3)

1. Interdict enemy sea power;

2. Conduct antisubmarine warfare and to
    protect friendly shipping; and

3. Conduct aerial mine-laying operations.

Before describing Base Level Organizations, the Air
Force command structure (Figure 3, Page 12) should be
explained.

FIGURE 3

EXAMPLE OF THE AIR FORCE ORGANIZATION

```
                          ┌──────────────┐
                          │     AIR      │
                          │   COMMAND    │
                          └──────────────┘
              ┌────────────────┼────────────────┐
              ▼                ▼                ▼
      ┌────────────┐   ┌────────────┐   ┌────────────┐
      │    AIR     │   │    AIR     │   │    AIR     │
      │   FORCE    │   │   FORCE    │   │   FORCE    │
      └────────────┘   └────────────┘   └────────────┘
              ┌────────────────┼────────────────┐
              ▼                ▼                ▼
      ┌────────────┐   ┌────────────┐   ┌────────────┐
      │    AIR     │   │    AIR     │   │    AIR     │
      │  DIVISION  │   │  DIVISION  │   │  DIVISION  │
      └────────────┘   └────────────┘   └────────────┘
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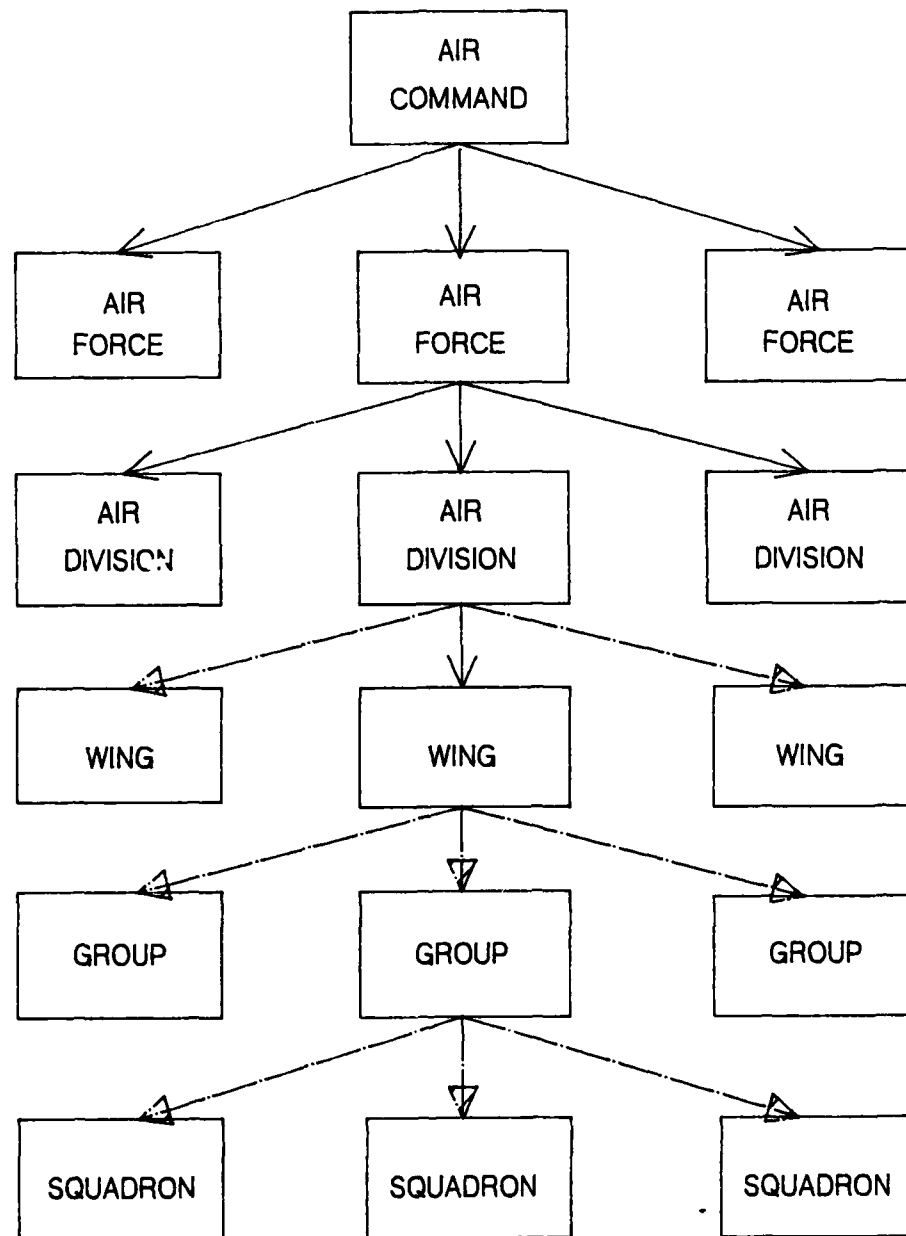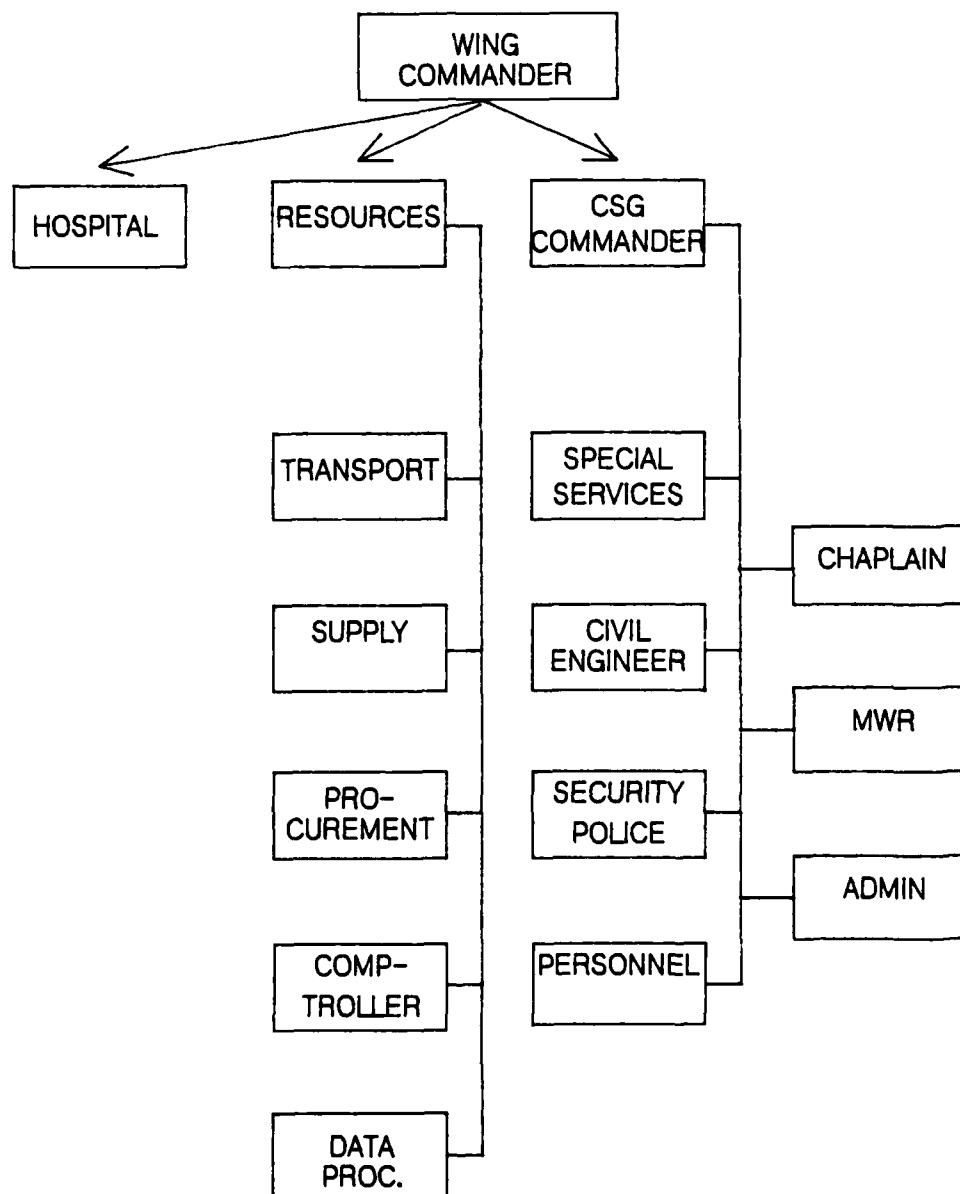
The command structure is as follows:(4)

1. Squadron - composed of a headquarters and two or more flights. This is the basic Air Force administrative unit and the smallest unit operated separately.

2. Group - composed of a headquarters and two or more squadrons.

3. Wing - composed of a headquarters and squadrons. A wing is capable of independent operations.

4. Air/Missile Division - composed of a headquarters and two to five wings.

5. Air Force - contains elements of two or more divisions designated to do a particular task.

6. Air Command - two or more air forces. An air command may not have aircraft or missile assigned to it. For example, the Air Force Logistics Command.

Hopefully, the importance of Base Level Organizations is clear. If these Organizations cannot function smoothly, the grass roots structure of the Air Force will begin to crumble. These units provide the Air Force with the information necessary to accomplish its' primary mission.

BASE LEVEL ORGANIZATION

Base Level Organizations exist to support the Base's numerous functions such as, flying, training, research, and development. A typical Base Organization is shown on Figure 4, Page 14. Even though the organizational structure of each Base varies to match its primary function, there are still numerous Organizations generic to each Base.

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FIGURE 4
TYPICAL BASE LEVEL ORGANIZATION

WING COMMANDER

HOSPITAL
RESOURCES
CSG COMMANDER

TRANSPORT
SPECIAL SERVICES
CHAPLAIN

SUPPLY
CIVIL ENGINEER
MWR

PRO-CUREMENT
SECURITY POLICE
ADMIN

COMP-TROLLER
PERSONNEL

DATA PROC.

14

These Organizations are:

1. Security Police: Provide security and law enforcement support for military facilities. This organization is normally divided into two branches, Operations and Administrative Security. Functions include protection of personnel and property, classified material and information, and traffic control and other activities similar civilian police departments.

2. Civil Engineering: Responsible for the maintenance and repair of Base building and facilities. Accomplishing these tasks requires services such as of carpenters, masons, welders, electricians, plumbers, cooling and heating specialists, and painters. In, addition, this organization maintains the Base utilities providing electricity, water, and gas to the Base.

3. Supply: Insures the day to day supplies necessary to keep the Base functioning are available. This includes locating the source of supply, order the items, update and follow-up on supply status, validate requirements and deliver the supplies or equipment to the requester.

Also, Supply acquires, stores, and dis-
tributes fuels to all military vehicles
on Base.

4. Comptroller: Assures effective financial
management throughout the Base, provides
accounting for appropriated funds pro-
vided for the operation of the Base and
the mission performance of all units
assigned to the Base. Also performs
management analysis and special studies
for any and all management problems en-
countered on the Base. This includes
providing an estimate of budgetary require-
ments, maintaining accounting records as
required by official Air Force Policy and
payment of financial obligations of all
units on Base.

5. Transportation: Services 24 hours a day
the Base's transportation needs, including
shuttle services on Base.

6. Vehicle Maintenance: Services military
equipment and supervises military and
commercial transportation of people,
house goods and supplies.

7. Procurement: Purchases locally produced
    goods and services need to support the
    Base in its daily activities.

8. Resource Plans: Assists the commander by
    providing planning, programming, budg-
    eting and special projects support in the
    resource management area.

9. Consolidated Base Personnel Office
    (CBPO): Pruvides personnel support for
    military and civilian people assigned to
    the Base.

10. Administration: Reproduces correspondence
    and training materials, stores and is-
    sues publications and forms, operates a
    postal distribution system and is respon-
    sible for operating the computerized word
    processing system on the Base.

11. Chaplain: Provides religious services.

12. Morale, Welfare and Recreation (MWR):
    Sees to the recreation and off-duty needs
    of the military family. Including oper-
    ating the Base club system, golf course,
    swimming pools, hobby shops, recreation
    centers and intramural athletic programs.

13. Public Affairs: Keeps Base people and
    local area informed of happenings on the
    Base. Also responsible for distributing

news releases to local, state, national
and international news media. Another
function is to monitor the speakers pro-
gram - individuals called on to talk about
the Air Force, their job, or give demon-
strations.

14. Hospital: offers services such as general
medicine, surgery, dentistry, internal
medicine,

15. Data Automation: Provides local computer
support to satisfy management and reporting
requirements of Base Level functional
activities. Presently, most Divisions
operate a Burroughs B3500 third genera-
tion computer system. This system normally
supports 20-40 terminals in areas such as
personnel, civil engineering, and the
comptroller.

If an Air Force Base is to function smoothly, all of these
Organizations must be able to capture essential data and
process it rapidly and efficiently. With the microcomputer
explosion, computer hardware/software is now available to
assist these Organizations with the capturing and processing
of data. As a result, Air Force managers and individuals
alike are wondering what exactly can a microcomputer do for
them. Microcomputers are powerful tools that can allow Base

Level Organizations to accomplish their functions more accu-
rately and faster. Plus, microcomputers can provide Users
with data base management systems to manage activities such
as, local inventory, personnel rosters, personnel evaluation
records, and personnel scheduling.

General Thomas M. Ryan, Jr., Commander in Chief, Mili-
tary Airlift Command(MAC), indirectly reflected how an
Information Center can be of use to these Organizations in
his response to the following question:(5)

> Q: Do you believe that MAC managers at all
> levels would increase their effectiveness
> by using a small computer as a management
> tool?
>
> A: I'm not convinced all MAC managers would
> have an effective application for a small
> computer, but I think that there are far
> more possibilities than have been addres-
> sed. I encourage our managers to investi-
> gate the potential that computers offer. .

As General Ryan points out, managers need to investigate
how microcomputers might be applied to their way of doing
business. An Information Center may be just the place for
managers to experiment with microcomputers.

ENDNOTES

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CHAPTER THREE

INFORMATION CENTERS
DEFINITION and FUNCTIONS

The Information Center is a powerful concept that can offer much in the way of computing power to a manager. Robert H. Torgler, Manager of IBM's Business Professional Center - Bethesda, MD., identifies the IBM policy on centers as follows: "The Information Center is neither a process nor a product, but a strategy a DP manager can use to support and manage a company's burgeoning information needs."(1) This chapter establishes an Information Center concept suitable for an Air Force Base. A historical look at the evolution of Information Centers will establish a framework necessary for developing an IC concept for an Air Force Base. The areas to be addressed in developing the Base IC, Figure 5, Page 22, are: a mission statement; IC functions; staffing, and evaluation. Next, criteria necessary for evaluating IC performance is presented. Finally, interview results are analyzed and the proposed Base IC concept is refined.

HISTORICAL LOOK

IBM-Canada, in Toronto, provided the impetus behind the current Information Center approach.(2) In 1973, several systems analysts were dedicated to the User community to

FIGURE 5
INFORMATION CENTER COMPONENTS

INFORMATION CENTER

MISSION STATEMENT

STAFF

EVALUATION

FUNCTIONS
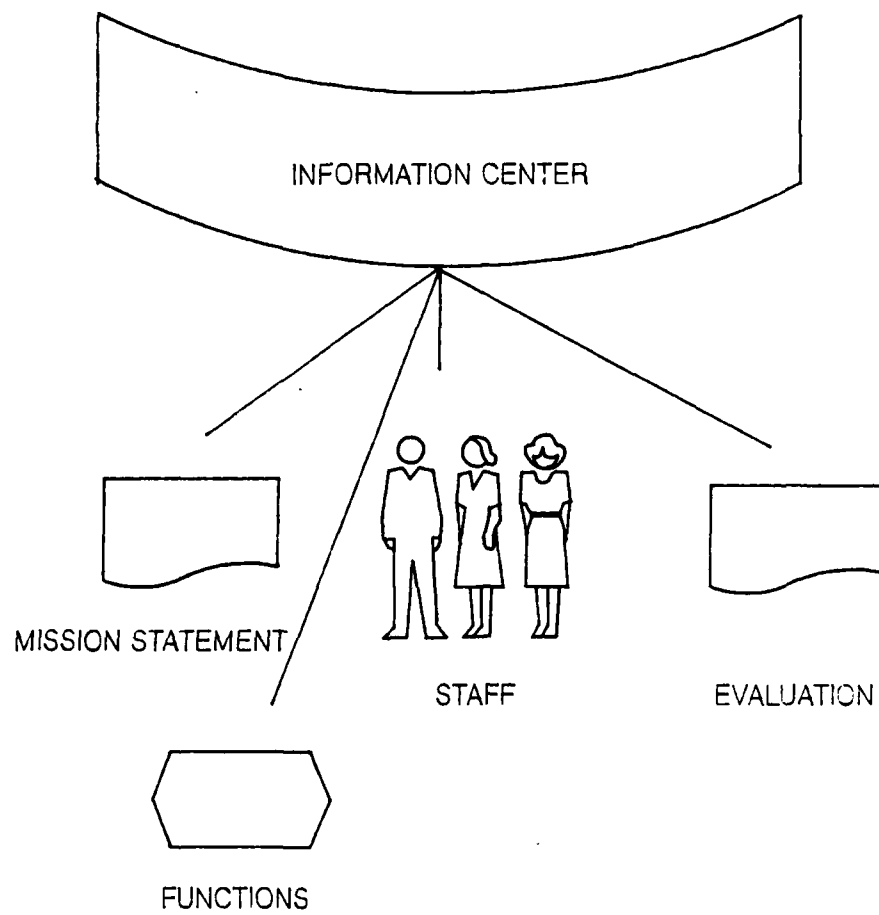
help Users create their reports rather than the DP Department creating the reports. Because the DP Department was very busy, whenever Users attempted to get information, existing work backlogs prevented the analysts from providing timely service. Consequently, when a request was completed by the DP Department, the User no longer needed the information.(3)

Therefore, the analysts were attempting to make the Users self-sufficient by providing: education; consultation; and problem resolution. A central office was established, where Users could have access to the company's large computer via terminals. Non-procedural languages, tools for non-DP personnel, were used to extract corporate information. A non-procedural language, such as FOCUS, allows the User to say what is to be done (ie., retrieve a report), rather than be concerned with the detailed procedure for how it is to be done. As originally planned, this concept was created to support the DP Department. However, the concept proved so successful in eliminating the backlog and assisting Users, that IBM started marketing the idea to its customers in 1979. The bottom line was the idea that Users must do their own processing with the help of the Information Center.

Next, the Mission Statement and IC functions will be examined in light of implementing an IC on an Air Force Base.

MISSION STATEMENT

A Mission Statement details the direction the Information Center should take. The Statement establishes how the Center will operate and how the work will be done. L. W. Hammand, IBM, defines a Mission Statement as, "a concise statement of what will be done, how it will be done, and by whom."(4) The statement should have three sections:(5)

1. **Mission Statement.** For example, "Creating an environment to assist people to use personal computing products; or providing ongoing advice and consultation to personnel using the IC; or marketing the IC within the organization."

2. **Steps to Accomplish the Mission.** This section describes the steps, techniques, and areas to be addressed to ensure the mission is accomplished. For instance, the following may be included:

   A. Procedures for installation of hardware and software;
   B. User needs and feedback surveys;
   C. Assist Users to do financial justifications
   D. Development and use of User training modules
   E. Preparation of articles for "advertising " what the IC has to offer.

3. **Type of work the IC can handle.** This section states the criteria to determine what types of work are acceptable for the IC environment. Such information should include: duration of effort, complexity of task, and User involvement.

The IC Operating Plan should be included in the Mission Statement as an appendix. The Operating Plan describes in detail the support the IC will provide to the User.
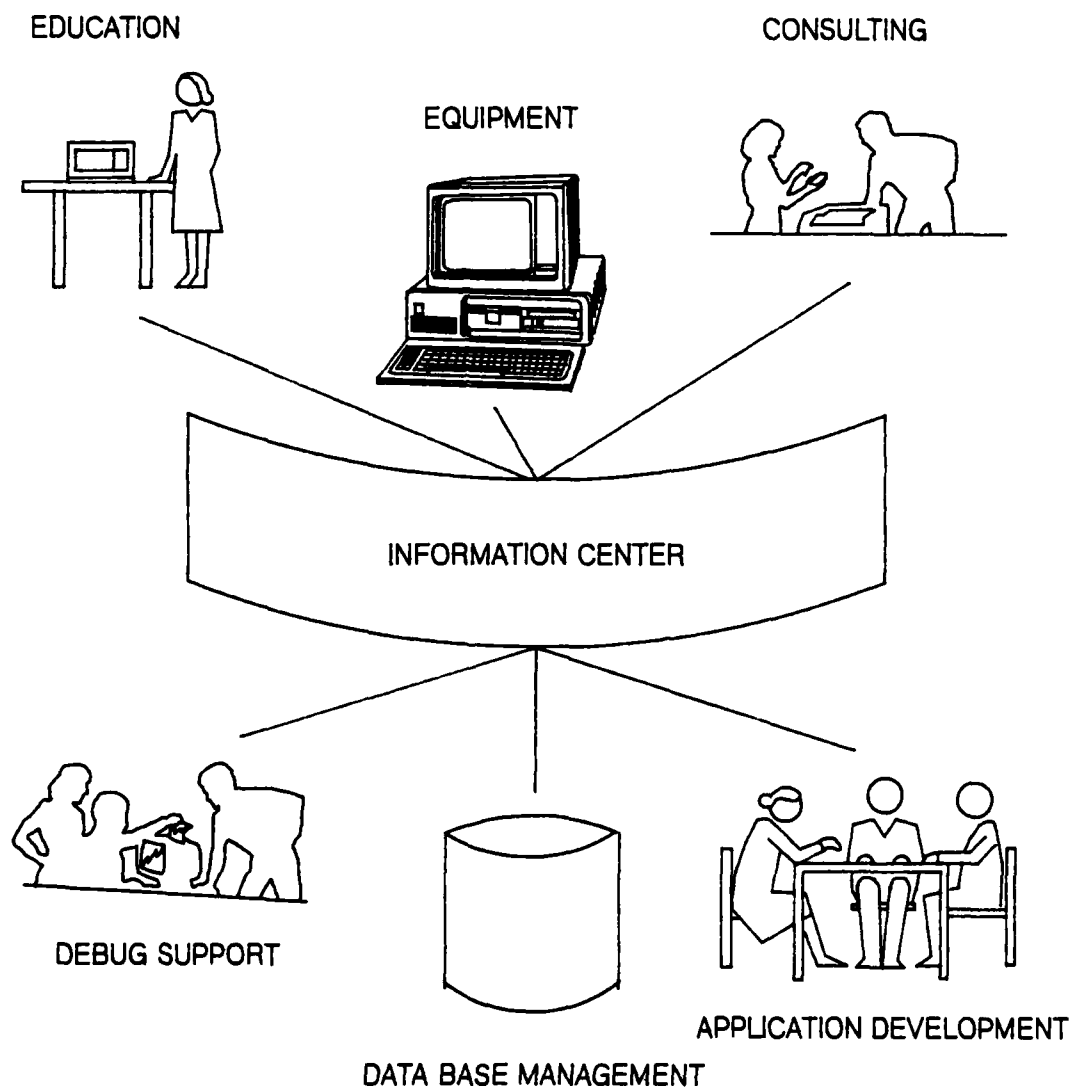
Developing the Mission Statement requires that all
interested parties (ie., User, IC management, and top man-
agement) work in concert from the beginning. This "joint
effort" is the first step in "Marketing" the IC concept.(6)
As such, the statement conveys to the User community that
the IC is being supported from the top.

FUNCTIONS

In order to support all Base Level Organizations,
the Information Center must be able to offer a variety of
functions. These functions, detailed in the following para-
graphs, are also illustrated in Figure 6, Page 26.

1. Education. A Center's function is largely educa-
tional. The Users must be introduced to the Center's hard-
ware and software. Formal education in the form of classes
in word processing, report generation, and package use
should be offered. Initially, courses may be taught by
vendors or others from the Air Force Training Command. Most
IC managers and related professionals are using traditional
classroom instruction techniques - not computer-based methods
- to train End Users in computer system use.(7) Computer-
based methods of instruction require the student to "inter-
act" or respond to information displayed on the computer
terminal by pressing the appropriate key on the keyboard.
This method allows the student to learn at his/her own pace.
Therefore, the Base Level IC should have a classroom, with
terminals, available for use. Having both the classroom and

FIGURE 6

INFORMATION CENTER FUNCTIONS

EDUCATION

EQUIPMENT

CONSULTING

INFORMATION CENTER

DEBUG SUPPORT

DATA BASE MANAGEMENT

APPLICATION DEVELOPMENT

terminals would allow either instructional method to be used.

As Users progress in their "expertise", the education can shift from a classroom environment to an "hands-on" environment. During a hands-on session, the student is using the terminal vs listening to an instructor describe how a terminal or software package may work. This helps to reduce "computer-anxiety".(8) Once the User is comfortable with the terminal, the instructional level can then be advanced to include more complex subjects such as programming with fourth generation language packages (such as LOTUS 123) or querying a data base. Fourth generation packages automate many of the basic functions that a User had to spell out when using third generation languages such as COBOL. Additionally, as new hardware and software is added, the Center will train the Users to use the new component. Hence, the education function is a dynamic one that either expands or contracts to meet the needs of each individual User. Thus, the User is given "tailored" help in using the Information Center.

2.   Controlling Equipment. The Center should take responsibility for monitoring the flow of micro-computers into the Base environment. This action will ensure that all equipment is compatible with the Center's resources. Plus allow the IC staff to provide adequate technical support with familiar equipment. Furthermore, the IC staff can

assist the Users with the "paperwork" required to comply with regulations for purchasing equipment (if desired).

3. Consulting. Working with computers and their associated tools are complicated enough for the "expert", let alone an End User. Consulting provides the "expert" User with assistance in performing non-routine User activities. These activities might include End User programming, feasibility analysis, availability of resources to meet the demand, or guiding the User in making the correct decision for developing an application.

4. Data Base Administrator (DBA). In conjunction with the User, the DBA determines what data should be in the data base(s). Also, the DBA identifies data-item synonyms and representation of them in the data dictionary. Furthermore, the DBA maintains reports cross referencing what data-items are used by Organizations. When Users, programmers or analysts require data that is not readily available, the DBA determines how and if the data can be retrieved. The DBA also monitors data base security, access lists, data base creation, and assigns update and delete permissions. Organizational responsibility, for the accuracy of each data-item, is also assigned by DBA. Finally, the DBA must survey the future needs of the User so the data bases can evolve and be compatible with these needs. (9) In short, the DBA controls and monitors all activity concerning the data base.

5. <u>Application Development</u>. Without a doubt, the ma-
jority of Users at an Air Force Base will be unskilled in
computer usage. Simple program generation can possibly be
performed by trained End Users. But, more complex program
generation can be perform by consultants on the IC staff.
However, this should be the exception, not the norm. The IC
should not replace the formal systems development done at
Gunter AFB, Alabama. If programming is done, it should be
with fourth generation languages (ie., nonprocedural lan-
guages specifying what action is to be accomplished, not how
the computer is to do the action) such as LOTUS 123, and not
conventional languages as FORTRAN or COBOL. Programming with
conventional languages is very time consuming and not readily
understandable by the Users.

6. <u>Debug Support</u>. This function's objective is to
relieve the User from "simple" problems. Debugging these
problems generally takes but a few minutes. However
the majority of the IC staff time will be spent debugging
User problems. Debug support can be in the form of a "hot
line", hand-outs discussing common problems, or simply just
personal reassurance that the proper technique is being
used.(10)

These six functions will provide the User with the
capability to access data. These functions supply the tech-
nical support and services needed. However, the IC will not
be successful, unless the IC staff can support the functions
and "win over" the User.

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INFORMATION CENTER STAFFING

An Information Center signals an important change in DP services offered to the User community. This change is direct service. The first meeting between computers and humans is very often the result of offering this service. As such, anxiety, fear, resistance and hostility are often the byproducts of this new relationship. Therefore, a properly staffed IC can provide a computing environment, free from these byproducts and one that is both productive and successful.(11)

According to L. W. Hammond, IBM, an IC manager plus two or three consultants can serve as the start-up staff.(12) However, this assumes that during the IC start-up period, the number of Users is limited to five and only one or two software packages are offered. A larger staff is required if the User group is increased in size or more software packages are offered. However, by initially limiting User group size and the number of software packages offered, IC growth may be controlled. If IC growth is not controlled, the danger exists for the IC resources to be overextended. Thus creating the same situations the IC is supposed to resolve. Initial IC staff duties should include:(13)

1. Installing new software packages;
2. Training on new packages;
3. Ensure "User-friendly" software package dialogues are available;
4. Developing User guides for the packages;
5. Developing education classes and associated materials for the packages;
6. Conducting project feasibility tests with Users;

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7. "Marketing" the Information Center and
    packages.

Of course, these duties are repetitive every time a new

package is acquired.

Staff Roles. The main roles are consulting, teaching,

and assisting Users at the terminal. Responsibilities

should include: supporting software packages; developing

training modules and presenting them; evaluating User re-

quests on approaches to solving problems; and "soothing"

User's anxieties. The following paragraphs explore the

roles closer.(14)

1. Consultant. Assists Users in developing
    requests for support. These individuals
    must be experts in the uses and func-
    tions of all packages available to the
    IC. Additionally, the consultant
    screens requests to ensure all guide-
    lines for IC use are adhered to and
    forward requests not appropriate for the
    IC to the systems development staff.

2. Teacher. Instructs Users on terminal
    access, problem-solving skills and pack-
    age use. Teach Users how to "spell out"
    needs in a manner suitable for the IC.
    Of course formal education classes are
    also a responsibility of the teacher.

3. Terminal assistance. Every staff member
    must be skilled and able to provide some
    level of terminal assistance to the
    User. For example, be able to answer
    simple questions about package usage,
    sign-on procedure and general terminal
    usage. The goal is to increase the
    User's confidence in using the terminal.

The staff member is an important key to the IC's suc-

cess. Therefore, as a general rule, the staff member should

have the proper attitudes to ensure the correct image of the

IC is received by the User.

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Such attitudes should include:(15)

1. Interpersonal communications skills
2. Initiative
3. Teaching Ability
4. Problem-solving skills
5. Patience and persistence
6. Application and package expertise
7. "Salesmanship".

INFORMATION CENTER EVALUATION - A REPORT CARD

As the IC is a relatively new concept, the application
of the concept must be evaluated constantly to allow correc-
tions as the IC evolves. A measurement system should in-
clude an appropriate chargeback system - a tool to allocate
costs back to the User. Since the Air Force is not in the
profit-making business, this chargeback should inform the
User about computer resource utilization (i.e., disk stor-
age, CPU time, paper usage). Collection of this information
will help both the IC's staff and the User in scheduling IC
usage and gauging the Center's supply usage rate (paper,
disks, etc.). This information gives the User an idea how
much the processing is costing.

Just as the User is evaluated, the IC staff and ser-
vices rendered must be reviewed. User surveys, issued pe-
riodically, must be undertaken. This action will provide
feedback necessary for staff evaluation. In addition, the
User could fill out a critique after completing each session
at the terminal. If the terminal is operating in an online
mode (attached directly to a computer mainframe), a critique
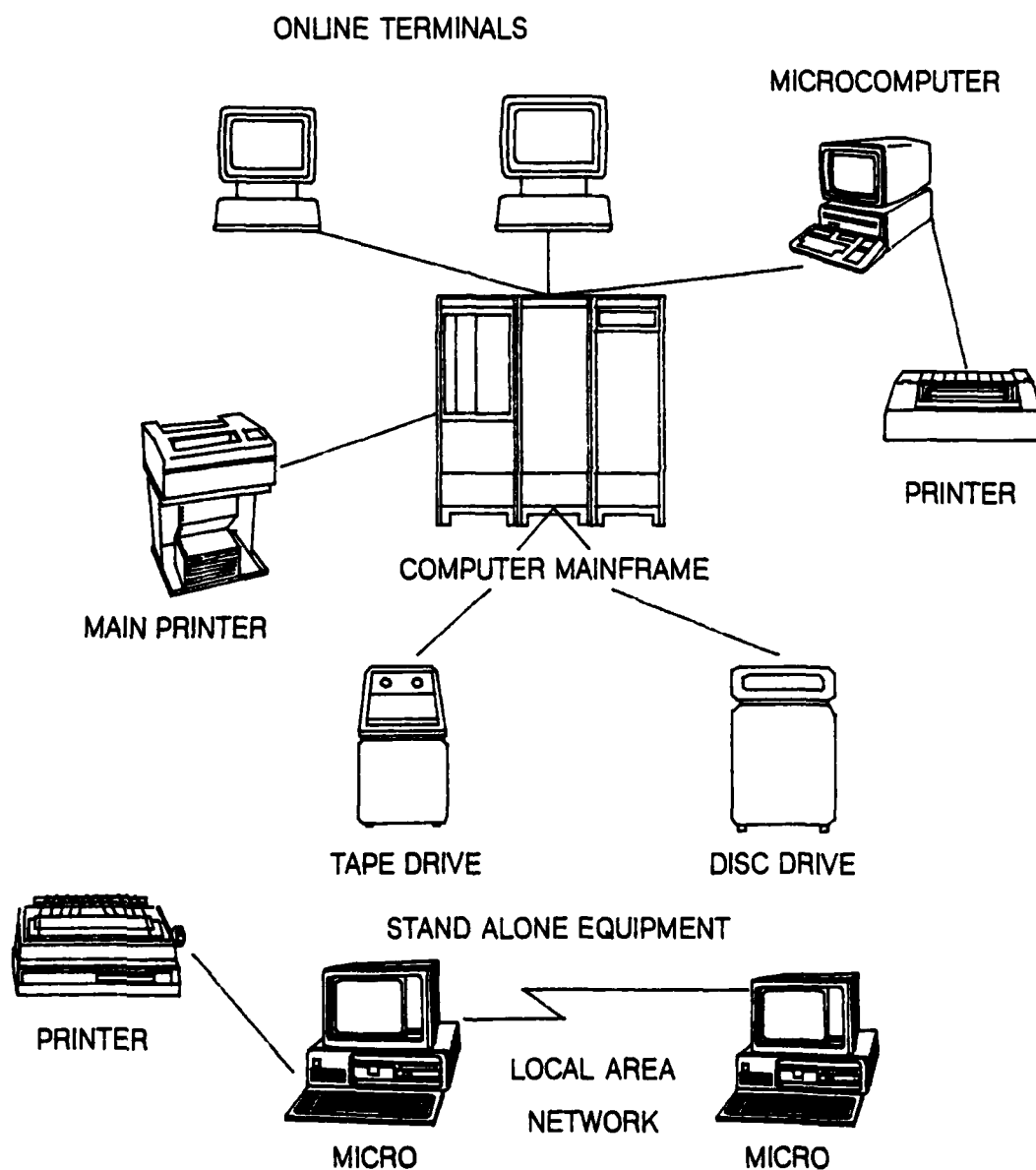form may be displayed on the terminal's screen. Thus, the

form may be displayed on the terminal's screen. Thus, the
review would be instantaneous and would require very little
User effort. This review could be done via the menu con-
cept. In this concept, the User "converses" with the compu-
ter and completes the critique.

HARDWARE and SOFTWARE

At this time, addressing general hardware and software
requirements would be beneficial in providing a look at the
physical aspects of an Information Center.

Hardware. An IC contains a variety of computer
related hardware. Figure 7, Page 34 illustrates an example
of hardware. A typical Center may include a mixture of
terminals linked to a computer mainframe or stand alone
microcomputer. The stand alone microcomputers can func-
tion independent of a large computer mainframe. A micro-
computer (or personal computer) is characterized by an in-
struction processor reduced to "microscopic" size. A
microcomputer contains a visual display screen and pos-
sibly two secondary storage floppy disk drives. A printer
may also be attached to the microcomputer. The micro may
converse with a larger computer via a modem. The modem
converts computer signals into a signal capable for trans-
mission over a phone line. In addition, a graphics capable
printer should also be included. Frequently, microcomputers
are linked in a "network". A network allows the movement of
information from one point to another point via a communica-
tions system such as phone lines.

FIGURE 7
AN EXAMPLE OF
INFORMATION CENTER HARDWARE

ONLINE TERMINALS

MICROCOMPUTER

PRINTER

MAIN PRINTER

COMPUTER MAINFRAME

TAPE DRIVE

DISC DRIVE

STAND ALONE EQUIPMENT

PRINTER

MICRO

LOCAL AREA

NETWORK

MICRO

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Software. Software needs in an IC also vary. Figure
8, Page 36, displays software packages generally found in
ICs. These include electronic mail, spreadsheets, data base
management, wordprocessing, graphics, decision support,
project scheduling, software to access a larger computer
mainframe, and report generation. A data dictionary should
also be included. A dictionary ensures standardized use of
all data-items and can simplify program generation.

INFORMATION CENTER LOCATION

Ideally, the information should be in a location cen-
tral to all Users. However, an Air Force Base typically
covers a large area and Base Level Organizations are not
always conveniently located close to each other. Therefore,
during the implementation phase, approximately four to eight
months,(16) all the IC resources should be located in one
location. Hopefully, this location should be near the Users
selected for the pilot group. The IC location must also
include classroom space for formal education presentations.
As Users no longer need constant assistance, computer equip-
ment may be installed in their respective areas. If assis-
tance is required, the IC staff can be reached by phone.

CONCEPT SUMMARY

Although functions and formats may vary from Base to
Base, the information presented in Table 2, Page 37, summa-
rizes the components of an Information Center suitable for
an Air Force Base. This concept was based solely upon

FIGURE 8
AN EXAMPLE OF
INFORMATION CENTER SOFTWARE

TABLE 2

BASE LEVEL
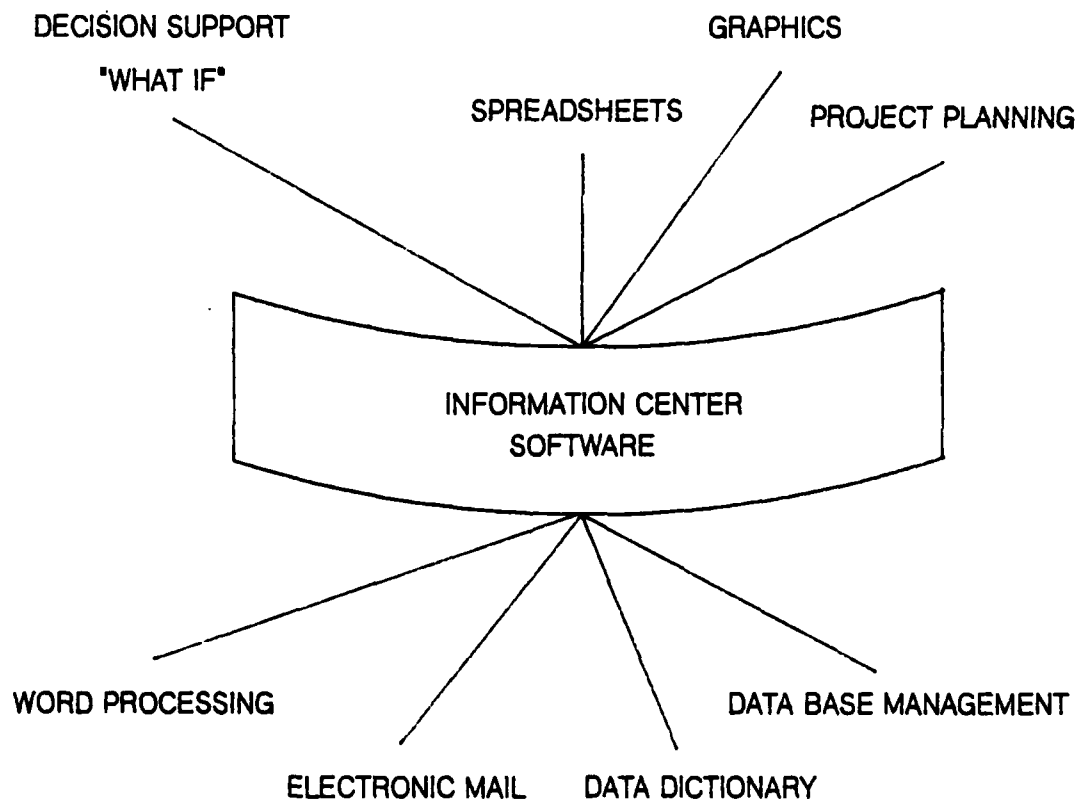### INFORMATION CENTER CONCEPT

<u>COMPONENT</u>   <u>DESCRIPTION</u>

Mission Statement   Details the direction the IC should
                       take. Four sections are:
                       1. Mission Statement
                       2. Steps to Accomplish Mission
                       3. Work the IC can handle
                       4. Operating Plan

Functions   Describes the services the IC will
                       offer. The six functions are:
                       1. Education
                       2. Controlling Equipment
                       3. Consulting
                       4. Data Base Administration
                       5. Application Development
                       6. Debug Support

Staffing   Capable of supporting the following
                       roles:
                       1. Consultant
                       2. Teacher
                       3. Assist in terminal operations

Evaluation   Procedures to monitor the performance
                       of the IC concept using techniques
                       such as:
                       1. A Chargeback System
                       2. User critiques, and surveys

secondary sources (i.e., computer-related articles and books). The concept contains four components: a mission statement, Information Center functions, a staff, and evaluation. The mission statement details how the Base Level IC will operate and the type of work the IC can handle. To service the variety of Base Organizations, the IC should offer the following functions: education; controlling equipment; consulting; data base administration; application development; and debug support. The final component, staffing, establishes an important relationship between the IC and the User community. The IC staff helps reduce Users' "computer-anxieties". The initial staff should have at least an IC manager and two or three consultants. The staff should be capable of supporting a variety of roles such as consultant, teacher, and assisting in terminal operations. In addition to these three components, procedures should be established to allow the IC's performance to be evaluated. This may be done via User's critiques and feedback.

In the next section, the results of interviews with IC managers, in the business community, will be used to refine this initial concept. This refinement provides first hand impressions about Information Centers.

INTERVIEW RESULTS

The information gathered in the interviews supports the concept illustrated in Figure 9, Page 39. The Information Center Managers concurred that their ICs contained portions of the four components addressed in the Base Level

FIGURE 9
BASE LEVEL
INFORMATION CENTER CONCEPT

MISSION STATEMENT

"THE MISSION IS"
STEPS TO BE
ACCOMPLISHED
WORK CRITERIA

OPERATIONS PLAN

INFORMATION CENTER

FUNCTIONS

STAFF

EVALUATION

EDUCATION

EQUIPMENT
CONTROL

CONSULTING

DBA

APPLICATION DEVELOPMENT

DEBUG SUPPORT

IC MANAGER

CONSULTANTS

TEACHERS

COMPUTER TERMINAL
INSTRUCTORS

CHARGEBACK

USER SURVEYS

CRITIQUES
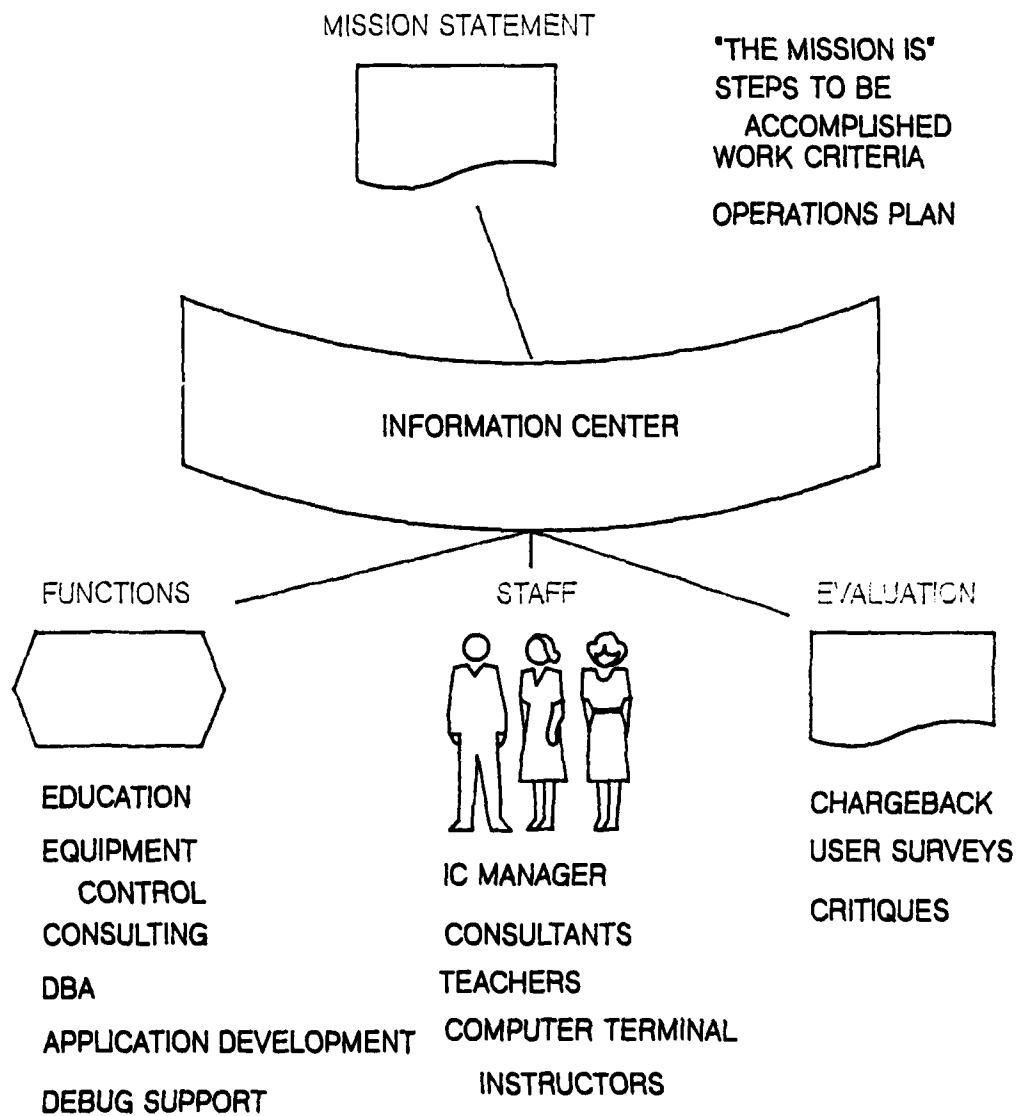
Information Center concept. Additionally, the Base Level IC

concept was enhanced with several ideas provided by the IC

managers. The enhancements occurred in the following areas:

1. **Mission Statements.** All the ICs contacted (see

Bibliography, Page 72) had an IC mission statement. From all

the information gather concerning mission statements, Mr.

Pazer's (IBM-Boulder, Colorado) comments were most

prudent.(17) He considers the mission statement to be dynamic.

As a result, Mr. Pazer re-examines his IC's mission state-

ment every year. His mission statement is concerned with

tactical (one year) and strategic (more than one year)

outlooks. In short, Mr. Pazer is allowing the mission

statement to evolve along with the User's computer needs.

Consequently, the mission statement proposed for the Base

Level IC should also be re-examined on a yearly basis, for

both tactical and strategic changes.

2. **IC Functions.** The functions proposed earlier (edu-

cation, equipment control, consulting, data base administra-

tion, application development, and debug support) were all

present in the ICs examined. However, beneficial informa-

tion was only gathered on these areas:

A. **Education.** The IC managers agreed that education

was the most important function offered by the IC. Mr.

Pazer said he enhanced his IC education program by submit-

ting articles to a IBM-Boulder newsletter. In addition, he

encourages successful IC Users to also publish articles.

This shows the Users that "one of their own" is successful at using the IC.

B. **Controlling Equipment.** All the ICs had strict policies controlling the hardware present in the IC and throughout their respective plants. IBM had an in-plant store. This store displayed all types of hardware available for purchase by the User. Therefore, any computer hardware selected must come from the equipment displayed in the store. Teledyne, on the other hand, had a strict policy -- only IBM equipment could be purchased.(18) As, the Federal Government and Department of Defense controls equipment purchased, these ideas cannot be used. The Federal Government requires all equipment be purchased via a vendor bidding process and the low bidder wins the contract.

Continuing with equipment control both Teledyne and IBM had a "vote" in approving or disapproving a hardware request. Mr. Hendrick, Teledyne Waterpick, observes who is using the IC.(19) If the request is initiated by a User who is not a frequent IC visitor, gaining approval for the request is very difficult. Mr. Hendrick uses this approach to control the frivolous use of a terminal. This control technique could be beneficial in controlling micro use at Base Level.

C. **Consulting.** The consulting being done in the ICs, matched the consulting function proposed in the Base Level concept, with a few exceptions. Mr. Pazer strongly encourages his Users to strike out on their own. In other words,

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the Users are not monitored concerning the size or scope of their IC work. As such, Mr. Pazer is not overly concerned that the Users may "bite off more than they can chew". Conversely, Mr. Hendrick continues to monitor the Users to ensure their projects are not too overwhelming. Initially, checking back with the Users is a good idea. However, constantly monitoring the project would be time consuming and could possibly cause a disruption of work. But, for the initial Base Level IC concept, these minor problems should be temporary ignored, and procedures for monitoring Users should be included in the IC operating plan. Monitoring the User's work may uncover operations in the IC that require further "fine-tuning".

3. IC Evaluation. In the ICs examined, there existed no formal evaluation procedures. Mr. Pazer, indicated that any type of productivity measurement is very dependent upon the individual. Therefore, the IBM-Boulder IC does not do any type of daily User evaluation. Yet, once a year, a User survey is undertaken to assess User attitudes about the IC. As User attitudes and impressions are very important during the implementation phase, the initial Base Level concept should still propose to conduct constant User appraisals of the IC. These appraisals may provide feedback necessary to adjust the IC concept.

CONCEPT REVISION

As a result of the information gathered from the inter-
views, the following areas in the concept were revised:
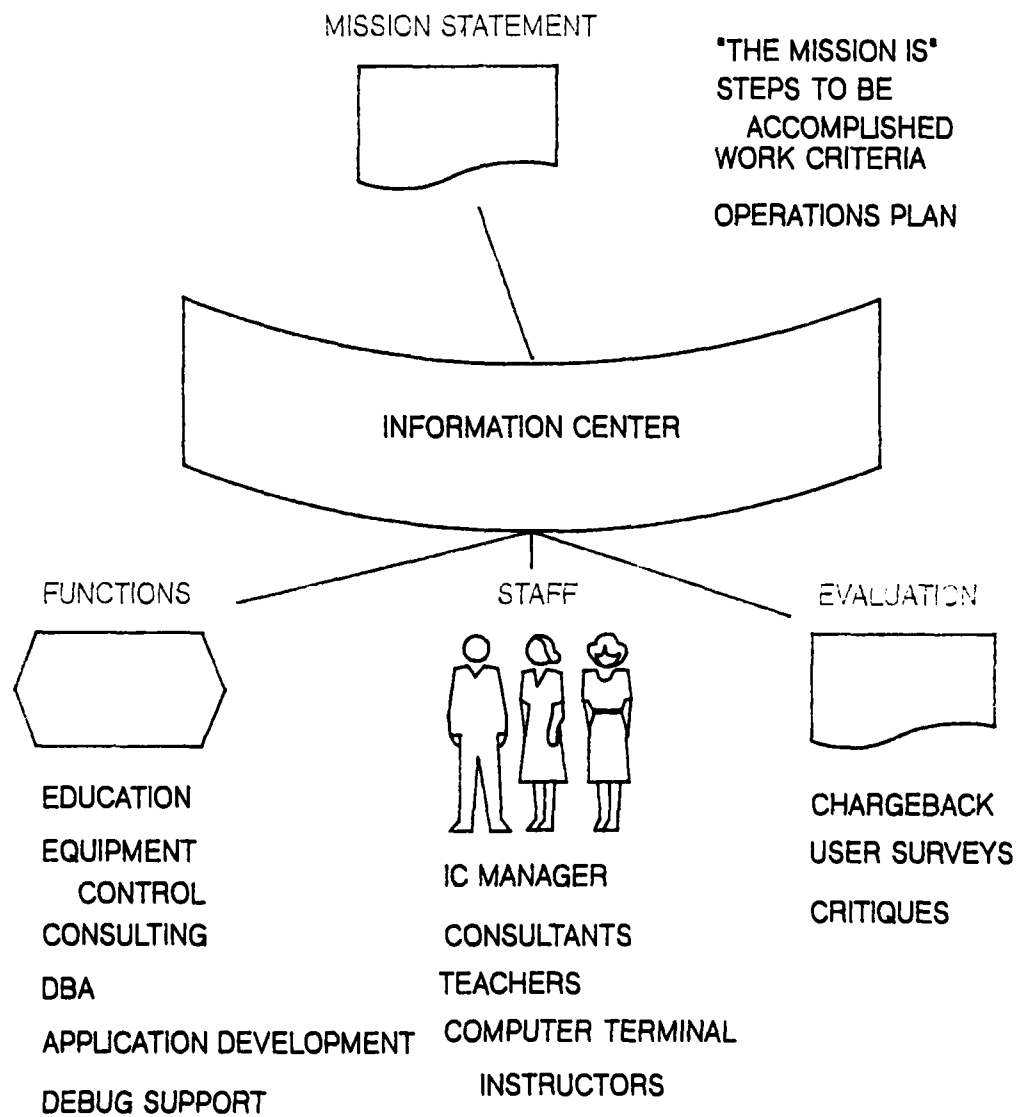
1. Mission Statement - include yearly revi-
    sion, thus allowing the mission statement
    to continually meet the Users' needs.

2. Functions -

    A. Education - expand IC publications to take
        advantage of Users' successes.

    B. Hardware Control - no revision.

    C. Consulting - during the initial implemen-
        tation period, continue monitoring User's
        projects to prevent the Users from taking
        on too much.

3. Staffing - no revision.

4. IC Evaluation - no revision.

In summary, the Base Level Information Center concept
is still comprised of four areas: mission statement; IC
functions; staffing; and IC evaluation. No major changes to
the concept were realized from the interview results. Only
minor adjustments to the mission statement and two functions
(education and consulting) were made. Table 3, Page 44 and
Figure 10, Page 45 illustrate the final concept.

TABLE 3

REVISED
BASE LEVEL
INFORMATION CENTER CONCEPT

COMPONENT	DESCRIPTION
Mission Statement	Details the direction the IC should take. Four sections are: 1. Mission Statement 2. Steps to Accomplish Mission 3. Work the IC can handle 4. Operating Plan
Functions	Describes the services the IC will offer. The six functions are: 1. Education 2. Controlling Equipment 3. Consulting 4. Data Base Administration 5. Application Development 6. Debug Support
Staffing	Capable of supporting the following roles: 1. Consultant 2. Teacher 3. Assist in terminal operations
Evaluation	Procedures to monitor the performance of the IC concept using techniques such as: 1. A Chargeback System 2. User critiques, and surveys

FIGURE 10
BASE LEVEL
INFORMATION CENTER CONCEPT

MISSION STATEMENT

"THE MISSION IS"
STEPS TO BE
    ACCOMPLISHED
WORK CRITERIA

OPERATIONS PLAN

INFORMATION CENTER

FUNCTIONS

STAFF

EVALUATION

EDUCATION

EQUIPMENT
    CONTROL

CONSULTING

DBA

APPLICATION DEVELOPMENT

DEBUG SUPPORT

IC MANAGER

CONSULTANTS

TEACHERS

COMPUTER TERMINAL
    INSTRUCTORS

CHARGEBACK

USER SURVEYS

CRITIQUES

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CHAPTER FOUR

NEEDS IDENTIFICATION
and
PROPOSED SOLUTIONS

Currently, Base Level Organizations are experiencing a variety of problems associated with decision-making activities.(1) These problems can possibly be alleviated with an Information Center. Hence, this chapter will identify and group the problems. Next, the Information Center Concept, identified in the Chapter Three, will be applied to problem groups in an effort to simplify or eliminate problems. The problem groups are: Education/Training, Timely Access to Data, and Application Backlog.

EDUCATION/TRAINING

The Air Force is a very dynamic environment. Individuals are generally required to PCS (Permanent Change of Station) or in civilian terms, transfer to new duty stations approximately every three to four years. Naturally, this constant moving creates "a void of knowledgeable individuals" in Organizations. As such, new individuals or even individuals currently in the Organization must be trained or retrained to fill the void. Currently, the Air Training Command is not equipped or manned to train every individual who requires computer access. Computer courses taught at

Kessler AFB, Biloxi, Miss., are mainly for new personnel entering the computer career field or advance training for those already in the field. These courses cover such topics as COBOL programming, timesharing usage, assembler programming (very technical) and data base management. Consequently, End Users must seek training either from the "resident guru" or educate themselves.

Furthermore, there are many individuals, "new recruits", entering the Air Force every month. These recruits are normally recent high school graduates with very limited exposure to computers (i.e., high school courses). Additionally, personal observation has shown that many "old timers" also have limited knowledge about computers. A recent Air Force decision concerning microcomputers further illustrates the need for computer training.(2)

Capt. Ronnie Hawkins, an Air Force DFI (Data Processing Installation) Chief, said the Air Force had recently ordered approximately 1,700 Zenith Z-100 Microcomputers.(3) These micros are for Base Level Organizations. Additionally, the micros will be dispersed to these Organizations without any training for the Users. Apparently, this situation will occur throughout the Air Force. Capt. Donnely, 2149 Information Services Squadron, reiterated the same point.(4) Consequently, the Air Force is acquiring potentially powerful tools, but the future Users will be "in the dark" concerning their use. Lacking any centralized agency to turn to for assistance, the Users could quickly become

frustrated. As such, the micros may be abandoned for the "old ways" of doing work by "stubbie pencil".

The Information Center can help solve this education problem. As David Kull notes, "The Information Center's function is largely educational."(5) The IC concept, defined in Chapter Three, addresses the basic User's training needs. For example, an IC instructor can teach Users how to operate a terminal or use a particular software package. As Users become more sophisticated, the IC staff will assist the User in learning the more complex features of a software package. Also via educational seminars offered by the IC, Users may discover simpler ways for accomplishing everyday requirements. Finally, if new software packages are acquired, the IC staff can educate the Users how to operate the new software packages.

The IC can also serve as a centralized point for supporting micros — both from a hardware and software viewpoint. As there are approximately 133 Base Level computer installations throughout the Air Force, standarization is a major concern. Via the IC, control could be maintained. For example, a central agency, responsible for IC software, can act as the repository for all IC software. This agency would control all software usage plus catalog and issue any software originated at Base Level to ICs, who can use the software. Furthermore, this agency could also provide standardized software operating instructions.

TIMELY ACCESS TO DATA

Currently, the majority of processing on the Base Level computer, a Burroughs B3500, is in batch mode. Batch processing is also called sequential processing because all instructions must be in a certain sequence. Essentially in this batch mode environment, computer punch cards are still predominately used. As such, the User's access to data is very slow. On an Air Force Base, the User is often required to go across Base to the central computer site and submit a card deck for processing. After the job is complete, the User must return and pickup the output. Thus the User has very little timely access to information. Capt. Hawkins indicated sixty percent of his computer's processing is devoted to batch processing. The majority of batch processing occurs at night.(6)

Query capabilities on the B3500 are very limited. A very rigid format must be followed. In other words, only "canned" or preprogrammed reports can be retrieved. In addition, the DPI staff is neither required nor manned to provide adequate support to help Users with their queries.

There are twenty-five different data bases resident on a Base Level computer. Essentially, each Organization has its own data base. Therefore, multiple queries must often be made to complete a report. As a result of these individual data bases, Capt. Hawkins remarked that approximately fifteen percent of this data is redundant in all data bases.(7)

As opposed to having the data and not being able to access it, some Organizations do not have any access to data processing capabilities at all. For example, the 90th Security Police Group at F. E. Warren AFB, Cheyenne, Wyoming, accomplishes its mission without any computer support. Lt. Col. Tom Safford, Deputy Commander, indicated that scheduling the security guards for each missile launch site, security patrols for the Base, managing the auto registration program, and monitoring the weapons and ammunition inventory requires an excessive amount of manpower.(8) In other words, Lt. Col. Safford would greatly benefit from any computer support.

The Information Center allows Users to access their own information when they need it. Under an Information Center, End Users learn the self-sufficiency required to retrieve their data when they need it as opposed to waiting on a "batch oriented" processing system. A technically oriented IC staff can solve most problems that a User might encounter in everyday processing.(9) As a result, the User is not left to "flounder" on his own, wasting precious time trying to access data.

The Data Base Administration (DBA) function of the IC also helps the User access data. The DBA will ensure the data, the User needs, is available. In other words, the DBA will coordinate with Users to ensure the necessary data is readily available; if not, steps will be taken to put the data into the proper format. For example, a User might

require a central data base be resorted into a different order for a one time access. The DBA can accomplish the procedures necessary to satisfy this request. In addition, the DBA's maintenance of a data dictionary will help simplify the redundant data problem. The dictionary is a catalogue of data types, giving their names, structures and information about usage. This dictionary allows cross-referencing between Users to show who accesses each data-item.(10)

Once the User's data is available, the IC Trainer and Consultant can assist the User. If the potential User is unskilled at data processing, or does not even know what can be done, the Trainer can be of great assistance. As education is a premier function of the Information Center, the Trainer can "enlighten" the User as to what the Information Center can do. When the User begins working in the IC, a Consultant can assist with product selection, generation of applications, debugging support and generally assisting the User in locating the data needed.

For an excellent illustration, consider the plight of the 90th Security Group at F. E. Warren AFB. A recent study conducted by Kenneth Engle, demonstrated how a simple data management system could be designed and implemented on an IBM Personal Computer.(11) Engle used the LOTUS 123 Spreadsheet Software to build the system. Engle's system used a key word to access information about periodicals. This same

methodology could easily be applied to a vehicle registration or inventory system in an Information Center environment.

APPLICATIONS BACKLOG

As the historical look in Chapter Three showed, the Information Center was initiated to bolster End User productivity and to reduce the applications backlog. Base Level Users are also experiencing this long wait for requested programs. Mr. Paul Austin, Deputy DPI Chief at Lowry AFB, Denver, Colorado, estimated the backlog for Base Level programs is approximately two to three years in length.(12) However, the Air Force backlog was not generated for the same reasons as the backlog experienced in the civilian world.

The civilian backlog has resulted from a surge in requests for computer programs. The backlog is comprised of requests for changes and enhancements to existing systems (ie., maintenance), new applications that interface with current systems, and requests for new stand alone applications or systems.(13) According to both Mr. Austin and Capt. Hawkins, the Base Level backlog is the direct result of the moratorium on program development at the Data Design Center at Gunter AFB, Montgomery, Alabama. Why? Because the Air Force is converting the software, currently executing on the B3500, for future operation on the new Sperry X3 1100/60s. The X3s are to replace the B3500s as the new Base

Level computer. Capt. Hawkins further indicated, the con-
version effort is being done line by line (ie., one line of
B3500 code for one line of Sperry code).(14) In addition,
the installation of the Sperry at Capt. Hawkins' computer
site has been delayed for six to nine months. As a result,
Base Level Users are being forced to wait for new software
programs. But, emergency program maintenance is still being
done on a case by case basis.

The Information Center concept can help the User and
the DP Organization lessen the backlog. Software provided
by the Center can be used directly by the User. Therefore,
the User can execute this software to do a variety of func-
tions such as graphics and report generation, financial
modeling, budgeting, information access, inventory control,
and personnel scheduling. The Information Center can also
address the hidden backlog.(15)

The hidden backlog consists of items required by indi-
viduals or groups. The backlog is hidden because these
items are never formally submitted to the DP Organization.
Although this task is difficult to measure, it can be eased
with the Information Center approach. The Air Force does
not allow any programming to be done by the Base DPI Staff.
All programs are standard and developed by the Design Center
at Gunter. Therefore, almost no flexibility exists to sup-
port individual requests at each Base. The Information
Center can provide the flexibility Users need to satisfy
their daily information needs. By allowing the Users to

create their own programs, the backlog and inflexibility of the Design Center at Gunter may be avoided. Thus, program requests that were never submitted because of the applications backlog may now be done by the User. Once individual programs are developed, they can be forwarded to a central Information Center. This Center could publish a catalog, announcing the availability of these and other programs for use.

George Harrar, COMPUTERWORLD Senior Editor for Features, remarked:

> "Two years ago, the Information Center was an appealing concept without a track record. Today, there is a record - the experiences of the companies which installed Information Centers early on. The Information Center promised much. Now the promises can be matched to reality by looking at the Center not as an IBM concept, but rather as an up-and-running part of several large American companies."(16)

In short, the Information Center can help simplify the decision-making and information gathering processes on an Air Force Base.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS,
and RECOMMENDATIONS

Information Centers are becoming popular.(1) Hence
this study's purpose has been to evaluate the Information
Center in terms of its application to Air Force Base Level
Organizations. The following paragraphs will summarize the
study's effort, beginning with Conclusions drawn from the
findings. Finally, recommendations for further study ef-
forts are provided.

SUMMARY

An examination of Air Force Base Level Organizations
established a framework for investigating the informational
needs of these Organizations. The Air Force's overall ob-
jective is to provide aerospace forces capable of supporting
the Nation's objectives in peace and war. An examination of
the Command structure revealed how important Base Level
Organizations are to the Air Force. As, General Arnold
said, "The success of our Air Forces in combat will be
determined by the perfection of the Organization that sup-
ports them."(2) Therefore, the majority of Chapter Two was
devoted to defining Organizations that are common on all Air
Force Bases and their associated informational needs.

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Attendees at the recent 1984 Information Center Conference and Exposition concurred that the Information Center Concept has changed since its conception by IBM.(3) In, Chapter Three, an historical look at the IC helped established why civilian businesses are accepting the Information Center. Simply stated, Information Centers are increasing End User productivity.

After this historical look, a preliminary Information Center Concept, applicable to an Air Force environment, was developed. The initial Concept addressed four areas: the Mission Statement, IC Functions, Staffing, and IC Evaluation. The Mission Statement details how the Base Level Center will operate, the type of work the IC can handle, and describes the steps and techniques the IC will follow. The Base Level IC should offer the following Education/Training, Controlling Equipment, Consulting, Data Base Administration, Application Development, and Debugging Support. One of the more important assets of the Base Level IC is its staff. The staff should be capable of supporting the roles of consultant, teacher, and provide assistance in operating the Center's equipment.

Next, to gain a first hand impression of ICs in the local business community, Information Center managers were interviewed. On the whole, there were very few differences between the preliminary Concept and information provided by the interviews. However, there was some useful

information concerning the IC mission statement, the education function, and the consulting function gathered.

Base Level Organizations are dynamic, changing constantly to meet the overall demands of the Department of the Air Force. Therefore, it makes little sense for the IC mission statement to "be cast in stone". Taking the idea from Mr. Pazer, IBM-Boulder, the mission statement must be reevaluated every year.(4) This reevaluation should be from both a tactical and strategic viewpoint. Hence, the Base Level IC's mission statement should be reevaluated from both these viewpoints. Education and consultation are both important functions offered by the IC. Mr. Pazer provided some useful information about "advertising" the Information Center's education function. He suggested that successful IC Users be encouraged to publish articles detailing their IC successes. These articles may appear in a company newsletter or an IC publication. Thus, this action may encourage other potential Users to come to the IC. Therefore, this idea was included in the final concept. Mr. Hendrick, Teledyne Waterpick, recommended that Users' IC activities should continued to be monitored during the IC's implementation phase.(6) This is an excellent idea as IC operations that may need "fine-tuning" can be uncovered. So, procedures for monitoring the Users' activities should be included in the IC's operations plan.

Chapter Four explored the decision-making and information needs of Base Level Organizations. As the Air Force is

essentially a big business, its education/training needs
are enormous. As noted by Joseph G. Izzo, President of JIA
Management Group INC., a California based management con-
sulting firm, "It (the IC) is a shortcut for Users to get
data and reports directly."(5) Base Level Organizations
have the same need to quickly access their information. End
Users are also confronted with an applications backlog.
However, this backlog is the result of a decision to replace
Base Level computers. But, the end result is the same, Air
Force End Users must wait for their new applications.

The Base Level Information Center concept developed in
Chapter Three can meet the Base Level needs. One function
of the Base IC is to educate/train End Users. The IC Data
Base Administration function can assist the User in acces-
sing data via a variety of data retrieval techniques. As
the IC encourages End Users to do "their own work", some of
the application backlog can be reduced.

Thus, the Information Center concept developed to meet
the needs of Base Level Organizations addresses four areas.

1. Mission Statement. This statement de-
   tails the direction the IC should take.
   Its four sections are: mission statement;
   steps to accomplish the mission; work the
   IC can handle; and an appendix containing
   the operating plan.

2. Functions. The IC should offer the fol-
   lowing functions: education; control e-
   quipment; consulting; data base adminis-
   tration; application development; and
   debug support.

3. Staffing. The IC should be capable of
    supporting the following roles: consult-
    ant; teacher; and assist in equipment
    operations.

4. Evaluation. Procedures to monitor the
    performance of the IC concept using tech-
    niques such as: a chargeback system or
    User critiques, and surveys.

CONCLUSION

There is one large difference between Information Cen-

ters and traditional Data Processing Departments. Via an

IC, Managers and employees (End Users) can retrieve informa-

tion directly instead of "pushing" a request through a team

of Data Processing analysts and programmers. As L. W.

Hammond, IBM, remarks:

> "The fundamental premise underlying an Information
> Center is that if provided proper education, tech-
> nical support, usable tools, data availability,
> and convenient assess to the system, users may
> directly and rapidly satisfy a portion of their
> business area requirements that depend on an I/S
> (Information Systems) environment."(7)

After examining the needs of Base Level Organizations,

the need for a Base Level IC is evident. As proposed in the

Information Center concept, functions such as report genera-

tion and modification, data retrieval, queries and

education can contribute significantly to facilitating End

User problem-solving activities and information needs.

In short, the Crwth Computer Coursewares, a vendor of

interactive computer-based training, believes a company's

success will ultimately depend upon its ability to train

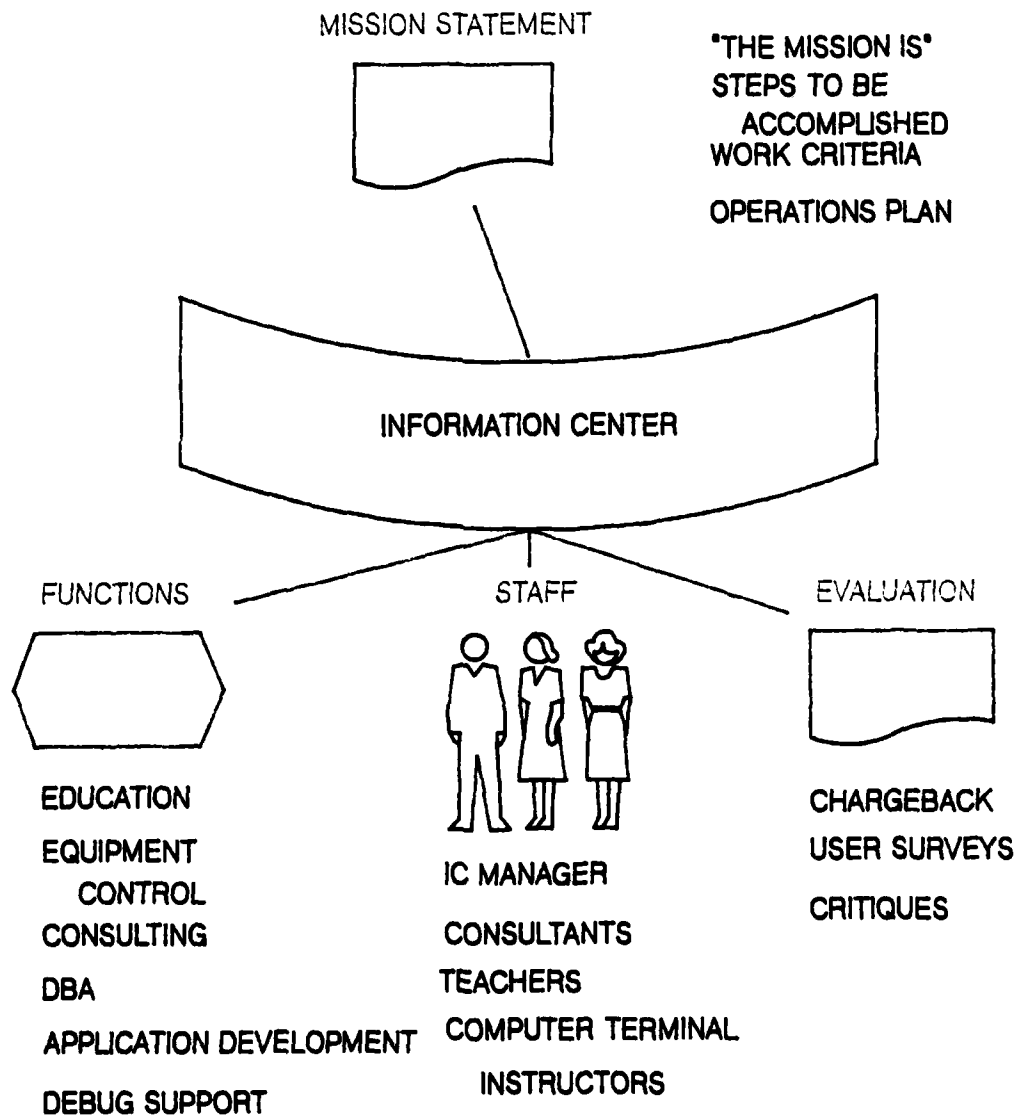large numbers of End Users to use information resources

advantageously. Furthermore, "By supporting End User com-
puting, the Information Center can play an important role in
providing faster, better access to corporate informa-
tion".(8) By applying an Information Center concept, the
Air Force could be in a position to better utilize its End
Users.

RECOMMENDATIONS

This study recommends an Information Center, using the
concept developed in Chapter Three, Figure 11, Page 65,
be implemented on an Air Force Base. Further time and
analysis must be devoted to an Information Center strategy
if the Information Center potential is to be realized.
Beginning Information Center operations based solely on this
study would be premature. Many areas such as hard-
ware/software selection, selection of initial Users, fun-
ding, etc., must be considered.

According to Chester R. Mills, the Information Center's
strategic planning process is divided into four areas: Po-
tential Information Center User Requirements Analysis; Po-
tential Information Center User Knowledge and Expertise;
Preparing for Information Center Implementation; and Under-
standing and Managing Information Center Operations and
Proliferation.(9) This study addressed only the first area,
Potential Information Center User Requirements Analysis.
Consequently, the remaining three areas must be researched
to establish a "complete" concept.

FIGURE 11
BASE LEVEL
INFORMATION CENTER CONCEPT

MISSION STATEMENT

"THE MISSION IS"
STEPS TO BE
  ACCOMPLISHED
WORK CRITERIA

OPERATIONS PLAN

INFORMATION CENTER

FUNCTIONS

STAFF

EVALUATION

EDUCATION

EQUIPMENT
  CONTROL

CONSULTING

DBA

APPLICATION DEVELOPMENT

DEBUG SUPPORT

IC MANAGER

CONSULTANTS

TEACHERS

COMPUTER TERMINAL
  INSTRUCTORS

CHARGEBACK

USER SURVEYS

CRITIQUES

The future for the Information Center is unlimited. It is a powerful concept that has substantial merit in today's Base Level information processing environment.(10) But, the power, per say, does not come from the Information Center concept. The power comes from what the Information Center makes possible in the mind of the User. Therefore, the Information Center concept and its application to Base Level Organizations should continued to be studied.

If, the Air Force decides to implement Information Centers to support Base Level Organizations, perhaps the remaining planning may follow these suggested steps:

1. Determine software and hardware requirements. Determine if any in-house programming will be done for IC software. Begin vendor selection process.

2. Select IC staff and begin their training.

3. Prepare for IC implementation by selecting a pilot base(s) for installation. Determine physical characteristics.

4. Select initial Users and begin their training.

5. Determine IC growth phases and evolution, for expansion to other Bases.

In closing, the Information Center concept holds the potential to establish a new User/Data Processing partnership which may, in the end, benefit the entire Air Force.

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